

Remarks

Claims 1-54 are pending in the application. Claims 1-6, 22-25, 29, 46-51, stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. pat. no. 4,577,604 (Hara et al) ("Hara '604"). Claims 7-21, 22-28, 30-50, 52-54, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hara '604 in view of the knowledge of one skilled in the art.

Claims 1 and 29 have been amended to require that a signal modulates the fuel pump such that fuel is metered to the combustion chamber. Support for these amendments is provided on page 3, lines 7-10 of the present application, which states that "fuel flow to a pressurized combustion chamber may be metered by varying the operating parameters of a fuel pump. Desired performance may be achieved without the throttle plates or valves or other restrictive devices that are normally used to meter the fuel flow to the combustion chamber." The specification further describes numerous embodiments of the invention that meter fuel flow to a combustion chamber with a modulated fuel pump without resort to downstream modulating devices, such as fuel injectors and the like. Claims 2-11, 13-19 and 22, which depend from claim 1, have been amended for consistency with claim 1. No new matter has been added.

Claim Rejections --- 35 U.S.C. §102(b)

Claims 1-6, 22-25, 29, and 46-51 stand rejected under 35 U.S.C.

102(b) as being anticipated by U.S. pat. no. 4,577,604 (Hara et al) ("Hara '604").

Hara '604 teaches a fuel pump connected to a downstream metering device such as a fuel injector. (See, e.g., Hara fig. 2 with fuel pump 14 and fuel injector 18.) The speed of the fuel pump is adjusted according to engine conditions by changing the voltage from a power supply to the pump (Hara '604, col. 1, line 64 to col. 2, line 9). The voltage applied to the fuel pump changes the fuel pressure in the fuel supply circuit. Thus, sufficient fuel pressure is available under high engine load conditions so that fuel may be metered into the combustion chamber by the fuel injectors. (See Hara '604, col. 1, lines 50-55, col. 3, lines 7-15 and col. 5, lines 24-37.). Hara neither teaches nor suggests using the control signal to the fuel pump to precisely control, i.e., to meter, the fuel flow into the combustion chamber. For example, in the preferred embodiment of Hara's invention, the pump runs at one of only two speeds: HIGH or LOW. (See Hara '604, col. 3, lines 7-15.) Fuel injectors downstream from the fuel circuit meter the fuel into the combustion chamber.

In contrast, in embodiments of the present invention the fuel flow to the combustion chamber is precisely controlled by modulating the pump with a signal. Fuel is metered to the combustion chamber without resort to downstream regulators such as throttle plates or fuel injectors. Claim 1, as amended, requires (in part):

“...b. a controller in signal communication with the pump, the controller modulating the pump with a signal such that the fuel flow to the chamber is metered.”

Since Hara '604 neither teaches, discloses, nor suggests a controller for a fuel pump that modulates the pump with a signal such that the fuel flow to the chamber is metered, Hara '604 cannot anticipate claim 1. Claims 2-6 and 22-25, which depend from claim 2 and add further limitations, are deemed not anticipated by Hara '604 for at least the same reasons as for claim 1.

Likewise, claim 29, as amended, requires (in part):

“...b. modulating the pump with a signal such that the fuel flow to the combustion chamber is metered.”

Since Hara '604 neither teaches, discloses, nor suggests modulating the pump with a signal such that the fuel flow to the combustion chamber is metered, Hara '604 cannot anticipate claim 29. Claims 46-51, which depend from claim 29 and add further limitations are deemed not anticipated by Hara '604 for at least the same reasons as for claim 29.

Claim Rejections --- 35 U.S.C. §103(a)

Claims 7-21, 22-28, 30-50 and 52-54 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hara '604 in view of the knowledge of one skilled in the art

These rejections for obviousness rely on Hara '604 for teaching the

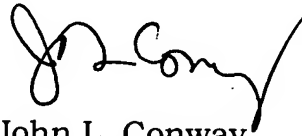
limitations of independent claims 1 and 29 in each of these dependent claims. For the same reasons as cited above for claims 1 and 29, Hara '604 neither teaches, discloses nor suggests these limitations. Therefore, claims 7-21, 22-28, 30-50 and 52-54 cannot be obvious over Hara '604 in view of the knowledge of one skilled in the art.

Further, Applicants respectfully traverse the rejection of claims 7-21, 22-28, 30-50 and 52-54 for obviousness on an additional ground. The examiner has not met his burden of factually supporting a prima facie conclusion of obviousness. See, e.g., MPEP 2142. A prima facie showing of obviousness requires *inter alia* "some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." See MPEP 2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. See In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Here, no showing has been made that a skilled worker would be motivated to employ the specific types of pumps and control methods disclosed in Applicants' application and claimed in claims 7-21, 22-28, 30-50 and 52-54 to achieve precise control of the fuel flow. For example, the statement that "it is well known in the art that different types of pumps can be used ... for the purpose of achieving appropriate work output." is not sufficient to establish prima facie obviousness. See MPEP 2143.01. Since a prima facie case of obviousness has not been established by the office action, claims 7-21,

22-28, 30-50 and 52-54 are deemed patentable.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 19-4972. Applicants request reconsideration of the rejected claims and a notice of allowance. The Examiner is requested to telephone the undersigned if any matters remain outstanding so that they may be resolved expeditiously.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John L. Conway". The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.

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